IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of KUTTAPPA, Sanjay

Filing Date: 23 MAY 2001

Serial No.: 09/863,910

Title: HEAVY FILLER IN GOLF BALL CORES

Examiner: GORDON, RAEANN

Group Art Unit: 3711

Att'y Docket: DSCK-1158-D1

DECLARATION UNDER RULE 1.131

I, SANJAY M. KUTTAPPA, do hereby declare and say that:

1. I am the sole inventor and applicant of the invention entitled "HEAVY FILLER IN GOLF BALL CORES" disclosed and claimed in 09/863,910 filed on May 23, 2001, which is a continuation of 09/393,905 filed July 15, 1999, which claims benefit to 60/093,229 filed July 17, 1998.

2. The invention described and claimed in the application was conceived and reduced to practice prior to November 4, 1996, as evidenced by the following facts, submitted and based upon my own knowledge.

(a) Attached hereto as a Exhibit A is a copy of a one page internal memorandum, which I authored, entitled "Dunlop Slazenger Corporation, Disclosures For Patent

Application Preparation" signed by me and witnessed by Mike Tzavanis on September 6, 1995. The exhibit accurately discloses the relevant information regarding the disclosed and claimed invention. The document memorializes the production and testing of a golf ball core containing a heavy filler with a specific gravity greater than 5.6 using litharge as the heavy filler. It should be noted that zinc diacrylate and zinc oxide are considered active ingredients at this loading in the core and therefore were not used as filers, but for their properties for curing the core.

(b) Attached hereto as Exhibit B is a copy of a three page internal memorandum, which I authored, entitled "Dunlop Slazenger Corporation, October Monthly Report, dated October 2, 1995. Litharge proved to be problematic with respect to health concerns. To solve this problem, mixtures using Bismuth, Bismuth Oxide, and Bismuth Subcarbonate were blended for formation into cores. The invention embodied in the September 6, 1995 disclosure was thus modified by including fillers having a specific gravity of 6 to 20 in addition to litharge to address health concerns. Attached to the October 1995 report is a copy of page 1537 entitled "Specific Gravity of Solids (Continued)," in which the referenced materials having a specific gravity of 6 to 20 are indicated by a bracket.

(c) Attached hereto as Exhibit C entitled "Core For High Spin '95, K5," is a copy of test results of a heavy weight core reduced to practice on October 3, 1995 that used Bismuth as a high specific gravity filler with 0.95% volume. Again it should be noted that zinc oxide and zinc diacrylate are not used as fillers, but as active ingredients for curing the core.

(d) Attached hereto as Exhibit D entitled "Core For High Spin '95, K6," is a copy of test results of a heavy weight core reduced to practice on October 3, 1995 that used Bismuth as a high specific gravity filler with 0.96% volume. Again, zinc Oxide and zinc diacrylate are not used as fillers but as active ingredients for curing the core.

(e) Attached hereto as Exhibit E entitled "Core For High Spin '95, B5," is a copy of a test of a heavy weight core reduced to practice on October 23, 1995 that used Bismuth Subcarbonate as a high specific gravity filler with a 1.46% volume. Once again zinc oxide and zinc diacrylate are not used as fillers, but as active ingredients for curing the core.

3. U.S. patent 5,833,553 to Sullivan discloses the use of any filler, regardless of specific weight, in covers and cores to reach a desired weight, but does not claim or teach the use of heavy fillers to maximize rubber content

and preserve core Coefficient of Restitution while maintaining a low compression by keeping the filler content below a volume of 1.95%. The reduction to practice of the claimed invention was before November 4, 1996, as supported by the exhibits, effectively removes the Sullivan reference as prior art.

4. My invention is covered by the claims of U.S. Application Serial No. 09/863,910.

All statements made herein of my own knowledge are true and all statements made on information and belief are believed to be true; and that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 8 of the United States Code, and that such willful false statement may jeopardize the validity of the application or any patents issuing thereon.

Signed:

_____

Sanjay M. Kuttappa Date:

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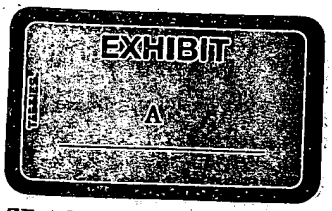
Signed:

Sanjay M. Kurtappa 3/8/2004
Date:



DUNLOP SLAZENGER CORPORATION

DISCLOSURES FOR PATENT APPLICATION PREPARATION

1) TITLE: Two piece Golf Ball core compound with litharge

2) INVENTOR(S): Sanjay M. Kuttappa
854 Issaqueena Trail, #504
Central, SC 29630

3) KNOWN RELEVANT PRIOR ART: None known.

4) OBJECT OF THE INVENTION:

An improved two piece golf ball consisting of a novel core composition, utilizing a high specific gravity (SG) compounding ingredient such as Litharge. The goal was to improve or maintain 'Coefficient of Restitution' (COR) while lowering compression for a given compound specific gravity.

5) ADVANTAGES OF THE INVENTION OVER THE KNOWN PRIOR ART:

Conventional fillers like silica, silicates, barium sulfate and zinc oxide (which have a SG of 2.0-5.6) were used in conjunction with materials like zinc diacrylates (ZDA) in cores to augment COR. Due to their comparatively low SG, more filler and/or ZDA had to be used in order to achieve desired compound SG and COR, which in effect increased compression. So higher COR was unattainable at desired compression levels. Litharge (SG of 9.5) was used in place of prevailing activators/fillers. This resulted in increased percent volume of the polymer content in the compound, lowering compression and giving enough latitude to improve COR.

6) DEFINITION OF THE INVENTION'S ESSENTIAL FEATURES:

The resulting golf ball showed improved COR and resilience at lower compression.

7) PREFERRED FEATURES:

This in essence gave better "feel" and "playability" over known golf balls without compromising distance.

8) SPECIFIC DESCRIPTIONS: EXAMPLES OF EMBODIMENTS/ILLUSTRATION AS APPROPRIATE:

Typical weight of two piece cores = 30.0 to 36.5g
Typical 'Parts per Hundred of Rubber' of Litharge in the core compounds = 3 to 18 PHR
Typical percentage of Litharge by weight in the core = 2% to 11%

INVENTOR: M Kuttappa DATE: Sept. 6, 1995

WITNESS: Mike Tzovaras DATE: Sept. 6, 1995

EXHIBIT
B

Maxfli

DUNLOP SLAZENGER CORPORATION

TO: John Calabria

cc: Mirka, Y.

FROM: Sanjay Kuttappa

DATE: October 2, 1995

SUBJECT: **OCTOBER MONTHLY REPORT**

I. PROJECT: J.P.S. RUBBER THREAD

A) ACCOMPLISHMENTS FOR SEPTEMBER:

- Testing completed on RGB023 experimental thread with cure changes. 323 cores were wound in the Big Bend machines. Windability and core compression were found to be good. 73% 100 compression balls obtained.
- 222 cores were wound with regular JPS thread on the Huestis winders as part of Ms. Rhodes' winding improvement studies. 92% 100-compression cores obtained. Cores from Huestis winding were found to not shrink as much as the cores from random weave or big bend winding.
- Compression loss were seen with the Big Bend machine windings when compared with the Huestis machines.

B) ACTION PLAN FOR OCTOBER:

- To try a 300 lb. sample pilot run of JPS RGB023 thread on the Huestis machine.

II. PROJECT: BALATA COVER

A) ACCOMPLISHMENTS FOR SEPTEMBER:

- No new progress due to other priorities.

III. PROJECT: HIGH SPIN '94 CORE

A) ACCOMPLISHMENTS FOR SEPTEMBER:

- The check for using litharge in the core turned out not feasible to run in the plant for environmental and health reasons. Alternate environmentally friendly high specific gravity powder materials like Bismuth, Bismuth Oxide and Bismuth Subcarbonate apart from copper have been sampled for trial.

B) ACTION PLAN FOR OCTOBER:

- Revise disclosures for patent application on litharge and incorporate use of all applicable high specific gravity fillers in the range of 6 to 20.

III. PROJECT: HIGH SPIN '94 CORE (Continued ....)

B) ACTION PLAN FOR OCTOBER:

- Conduct lab trials on alternate high specific gravity materials with and without regrinds. Also, conduct trials on a different antioxidant and peroxide system in parallel in order to check for improvement of durability of the high spin cores.

IV. PROJECT: SOFT COVER BLENDS WITH TPE

A) ACCOMPLISHMENTS FOR SEPTEMBER:

- Completed two iterations of three, for various blends. Table of results for iteration numbers 1 and 2 are attached in Appendices I and II. Results look encouraging. A slight delamination seen in a couple of urethane-ionomer blends.
- III iteration blending and molding of 2-piece balls completed. The list of blends can be found in Appendix-III.

B) ACTION PLAN FOR OCTOBER:

- To continue work to schedule with Mr. Tzivanis. Complete III iteration testing and molding of 3-piece balls. Complete physical and player testing of 3-piece balls.

V. PROJECT: SET-UP AND PROCURE LAB EQUIPMENT

A) ACCOMPLISHMENTS FOR SEPTEMBER:

- All rubber lab equipment installed and ready to go. Purchase requisitions for lab apparatuses submitted.

VI. PROJECT: ADHESION TEST - COVER TO CORE USING RFL SYSTEMS

A) ACCOMPLISHMENTS FOR SEPTEMBER:

- Further testing of three concentrations of the R6/M3 bonding agent carried out, without and with latex, to check for durability and adhesion. Results are tabulated in Appendices IV and V respectively.
- From data obtained R6/M3 without latex still gave the best results in terms of adhesion, penetration, retention of compression and weight pick-up. Initial velocity was found comparable to the control in all cases.

B) ACTION PLAN FOR OCTOBER:

- To check for feasibility to run a pilot/plant trial and from other environmental/ health aspects.
- R-F-L dip system vendor survey, quotes and samples to be evaluated.

Enclosures

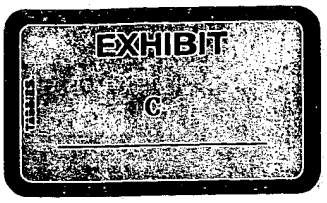
Specific Gravity of Solids (Continued)

Substance	Specific Gravity
Potassium sulfate	2.66
Potassium dichromate	2.69
Aluminum	2.70
Chromium trioxide	2.70
Potassium permanganate	2.70
Sodium sulfate, anhydrous	2.70
Calcium carbonate, precip.	2.71
Potassium chromate	2.73
Potassium bromide	2.75
Sodium fluoride	2.79
Bismuth nitrate ($5H_2O$)	2.83
Uranyl acetate ($2H_2O$)	2.89
Zinc chloride	2.91
Chromic sulfate, anhyd.	3.01
Beryllium oxide	3.02
Cuprio chloride, anhyd.	3.05
Platinous barium cyanide ($4H_2O$)	3.05
Cadmium sulfate ($2\frac{2}{3}H_2O$)	3.09
Potassium iodide	3.13
Barium chlorate ($1H_2O$)	3.18
Calcium fluoride	3.18
Sodium bromide	3.20
Barium formate	3.21
Barium nitrate	3.24
Potassium bromate	3.27
Magnesium trisilicate	3.28
Sodium bromate	3.34
Calcium bromide	3.35
Vanadium pentoxid	3.35
Lithium bromide	$3.46\frac{25}{4}$
Barium	3.5
Magnesium oxide	3.58
Sodium iodide	3.67
Nickel sulfate, anhyd.	3.68
Strontium carbonate	3.70
Arsenic trioxide	3.8
Barium chloride	3.86
Potassium iodate	3.89
Strontium sulfate	3.96
Barium bromate	3.99
Iodoform	4.01
Titanium dioxide	4.17
Strontium bromide	$4.22\frac{24}{4}$
Cadmium carbonate	4.26
Sodium iodate	4.28
Silver nitrate	4.35
Barium carbonate (witherite)	4.43
Barium chromate	4.50
Barium sulfate	$4.60\frac{15}{4}$
Molybdenum trioxide	4.50
Lead nitrate	4.59
Strontium iodide	$4.55\frac{25}{4}$
Lead formate	4.63
Antimony trisulfide	4.64
Barium molybdate	4.65

Substance	Specific Gravity
Arsenic, amorphous	4.7
Bismuth trichloride	4.75
Selenium	4.80
Bismuth subnitrate	4.93
Iodine	4.93
Barium iodate	5.00
Cadmium bromide	5.19
Ferrosoferric oxide (magnetite)	5.2
Chromic oxide	5.21
Ferric oxide	5.24
Mercury bichloride	5.44
Silver sulfate	5.45
Zinc oxide	5.47
Cadmium iodide	5.67
Ferrous oxide	5.7
Arsenic, metal, cryst.	5.73
Lead chloride	5.85
Cuprous oxide	6.0
Mercuric bromide	6.05
Lead iodide	6.16
Lead sulfate	6.2
Mercuric iodide, red	6.28
Lead chromate	6.3
Barium tungstate	6.35
Cupric oxide	6.40
Cadmium iodate	6.48
Lead bromide	6.66
Antimony	6.68
Bismuth subcarbonate	6.86
Zinc	7.14
Mercurous chloride	7.15
Chromium	7.20
Tin	7.31
Gold chloride (ous)	7.4
Iron (steel)	7.6–7.78
Mercurous iodide, yellow	7.70
Bismuth oxychloride	7.72
Bismuth oxyiodide	7.92
Bismuth oxybromide	8.08
Cadmium oxide	8.15
Cadmium	8.64
Cobalt	8.9
Nickel	8.90
Copper	8.94
Lead dioxide	9.38
Lead monoxide, Litharge	9.53
Thorium oxide	9.7
Bismuth	9.78
Silver	10.5
Mercuric oxide, red	11.14
Lead	11.34
Tantalum	16.6
Gold	19.3
Tungsten, Tungsten Carbide	19.3
Platinum	21.45

Molybdenum

10-2



Gray-MD JSP cores

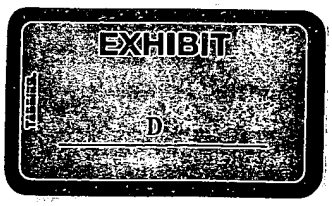
CORE FOR HIGH SPIN '95

K5
W/BISMUTH
W/ZnO

10/3/95

MATERIAL	PHR	S.G.	VOL.	VOL%	BATCH WEIGHT
NEO-40	84.00	0.91	92.31	68.10	420.0 ✓
ZDA/JHP-M.B.	50.00	1.27	39.28	28.98	~~250.0~~ 247.9 ✓
VESTANEMER 8012	0.00	0.91	0.00	0.00	0.0
REGRIND (FINE)	0.00	1.17	0.00	0.00	0.0
BISMUTH	12.60	9.80	1.29	0.95	63.0 ✓
ZINC OXIDE	5.00	5.60	0.89	0.66	25.00 ✓
STRUKTOL TMQ	0.00	1.06	0.00	0.00	0.00
MICRO-WAX	0.00	0.92	0.00	0.00	0.00
DI-CUP 40KE	0.00	1.55	0.00	0.00	0.00
TRIGONOX 29/40	2.50	1.40	1.79	1.32	12.50 ✓
TOTALS	154.10	1.1368 1.1368	135.56	100.00	770.50 770.5000
				5	677.7834 1705.1907
COMPOUND S.G.		1.1368			160.26

Add ~ 2-10 g ZDA/JHP



Mix Yellow Rel. 3
Slight Purple
cast

CORE FOR HIGH SPIN '95

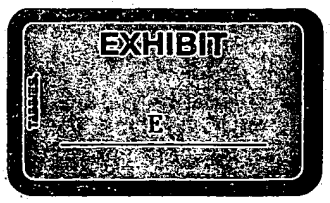
K6
W/BISMUTH
W/ZnO+AO

10/3/95

MATERIAL	PHR	S.G.	VOL.	VOL%	BATCH WEIGHT
NEO-40	76 ~~84.00~~	0.91	92.31	67.07	~~420.0~~ 380
ZDA/JHP-M.B.	50.00	1.27	39.28	28.55	~~250.0~~ 247.9
VESTANEMER 8012	0.00	0.91	0.00	0.00	0.0
REGRIND (FINE)	0.00	1.17	0.00	0.00	0.0
BISMUTH	12.95	9.80	1.32	0.96	64.8
A.O. – MB	10.00				50.0
ZINC OXIDE	5.00	5.60	0.89	0.65	25.00
STRUKTOL TMQ	~~1.00~~	1.06	0.94	0.69	~~5.00~~
MICRO-WAX	~~1.00~~	0.92	1.09	0.79	~~5.00~~
DI-CUP 40KE	0.00	1.55	0.00	0.00	0.00
TRIGONOX 29/40	2.50	1.40	1.79	1.30	12.50
					782.25
TOTALS	156.45	1.1368	137.62	100.00	782.2500
		1.1368			
				5	688.1137
					1705.2050
COMPOUND S.G.		1.1368			769.29

NOTES: Keep mill temp – 200°F until A.O. is mixed.
Then start cooling water and add Trigonox.

Add 2-10 g ZDA/SHP



CORE FOR HIGH SPIN '95

B5
W/3.0 ZnO
W/(BiO)2CO3
Lower Lay/LT Blue

10/23/95

MATERIAL	PHR	S.G.	VOL.	VOL%	BATCH WEIGHT
NEO-40	~~84.00~~ 79	0.91	92.31	67.93	~~504.0~~ 474 ✓
ZDA/JHP-MB	~~50.00~~ 55	1.27	39.28	28.91	~~300.0~~ 330 ✓
BISMUTH SUBCARBONATE	15.82	8.00	1.98	1.46	94.92 ✓
ZINC OXIDE	3.00	5.60	0.54	0.39	18.00 ✓
TRIGONOX 29/40	2.50	1.40	1.79	1.31	15.00 ✓
TOTALS	155.32	1.1430 1.143	135.89	100.00	931.92 931.9200
				6	815.3479 1714.4582
COMPOUND S.G.		1.1430			

930.56
~ 1.36